ether insoluble fraction, and an ether soluble fraction).

A number of years ago considerable interest was aroused by the Much-Deycke partial antigens, which were intended for therapeutic use after skin-testing with each to determine the particular respects in which resistance or immunity of the patient was lacking. Much separated four partigens: one, the water-soluble toxin, and three partial antigens; one, fatty acid lipoids soluble in alcohol; one, neutral fats soluble in ether, and an albuminous residue insoluble in its nature. This conception and practice of Much-Deycke never had great acceptance, and at this time we hear no more of it.

Nevertheless if these different views and efforts are not substantiated in full, they have at least a measure of value and help to point the way for future investigation.

Doctor Eberson's work is being followed with great interest, and we are hoping for real advances in diagnostic methods as a result of his efforts.

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DOCTORS EBERSON and WOLFF (closing).—The discussions have covered the topic so thoroughly that our sole addition to them must be a word of appreciation to Doctors Bush, Pottenger and Bramkamp.

It is frankly admitted that such an important problem as is indicated here cannot be solved in the short time—almost five years—which we have thus far devoted to this clinical experimental investigation. However, it will be shown in our paper when it is published in full that a detailed clinical analysis of nearly 350 cases may be made more convincing when the material is evaluated by correlation and comparative studies.

We feel with Doctors Pottenger and Bush that there is great need for a preparation of tuberculin capable of differentiating active from latent and inactive tuberculous lesions. Although our results suggest that such a substance may be obtained, we are primarily interested in showing by comparative tests that the old tuberculin is certainly less efficient than the tuberculin fraction (T. E.) as a diagnostic agent.

That there have been and are now being produced numerous substitutes for old tuberculin is a healthy sign. What has been lacking, however, is a comprehensive study of clinical material with the newer preparations. We believe that several hundred patients studied thoroughly, and with the clinical and laboratory data properly analyzed, will give as cogent a demonstration as several thousand patients. Larger series over many years will naturally add confirming or refuting facts, but a scientific analysis of even a small group of cases can tell much.

The therapeutic value of tuberculin prepared from nonprotein culture media is suggested naturally. We have already had some experience with the T. E. (tuberculin fraction) in tuberculous choroiditis, resulting in a complete cure when old tuberculin, used similarly had failed to alter the clinical picture. Such a series would be of value, particularly when the therapy has been followed carefully in the eye clinic.

From the point of view of sensitization to the tuberculin product, it is important that we distinguish between specific and nonspecific reactions following repeated injections of substances containing tuberculin along with proteins from culture media. This criticism cannot be applied to the use of "synthetic" nonprotein media in which the products of tubercle bacilli are elaborated without reference to foreign proteins. In this instance sensitization that might develop from repeated injections of T. E. would indicate a specific response to the bacillary substances. Only in this sense, therefore, could it be correctly stated that sensitization to tuberculin might occur.

THE INDUSTRIAL PHYSICIAN—HIS RELATION TO PATIENT AND CARRIER *

By JAMES EAVES, M. D.
San Francisco

DISCUSSION *by C. A. Dukes, M. D., Oakland; Otto R. Frasch, M. D., San Francisco.*

IN industrial practice the physician or surgeon at all times is under the most critical scrutiny. He must satisfy patients, employers, insurance companies, and always be prepared to prove the correctness of his treatment. The industrial surgeon is a necessity; and industrial surgery is a specialty in itself.

REQUISITES OF AN INDUSTRIAL SURGEON

Besides the requisite surgical training the industrial specialist must have an abundance of tact, patience and understanding. He must be farsighted enough to realize that, although he is paid by the insurance companies, his success is dependent in the last analysis, not on the organization which pays him, but on the individuals who receive his services. He must satisfy both, but primarily he must satisfy his patients. He must be meticulously careful in his treatment of industrial cases, realizing always that the industrial patient is practically forced to accept his services, and usually accepts them in the expectation of getting second-rate treatment.

The patient tells his fellow employees, the organization for which he works, and the insurance company what he thinks of the services rendered, whether he received good or bad treatment at the hands of the industrial surgeon. Cumulatively these opinions will make or mar a surgeon's reputation. No employer or insurance company will send cases to a surgeon who consistently is given the reputation of rendering unskillful or rough-shod service, technically or psychologically.

INDUSTRIAL ACCIDENT ACT OF CALIFORNIA

Although the Workman's Compensation Law of the state of California places a limit on the amount of compensation allowed an injured workman, it places no limit on the cost of duration of medical service to be rendered. The law in regard to the furnishing of medical, surgical and hospital treatment is liberal, but there is nothing of charity in its liberality. Efficiency of manpower is as essential to society as it is to any given industrial enterprise. In general the greater the efficiency the greater the production of goods in any industrial or social organization. Economically and socially, therefore, it is of practical value to society to insist on a prompt return to work of the thousands of workmen injured in the state every year.

The prompt return to work of injured employees can be brought about only by efficient medical and surgical service. But it has become apparent that doctors as individuals must train

* Read before the San Joaquin County Medical Society, Stockton, March 1, 1928.

themselves in human understanding, sympathy, insight and tact in order successfully to handle the various phases of industrial accident treatment with satisfaction to all parties. So much depends upon the study of human nature in the individual patient that no code of rules can satisfactorily meet the needs. The element of neurosis inherent in so many who are injured and so easily evoked by improper handling requires the greatest care in the selection of those who are to treat or come in contact with the injured. The theory is applicable all through the treatments. It applies to treatment by claim adjusters as well as by surgeons. It applies equally well to treatment of family and friends of the injured. It might be summed up as ability to inspire confidence, in your surgeon, your technician, one's self, and the future.

SUCCESSFUL INDUSTRIAL SURGERY

Industrial surgery must be practiced on a large scale in order to be successful. Although the fees are paid in cash and are paid promptly they are lower than those paid in private cases. The overhead expenses for medical personnel and equipment are far higher than would be necessary in private practice. Here and there a physician or surgeon seems to desire industrial practice because he assumes it is an easy method for him to pay his rent and overhead. Other surgeons seemingly enter the field of industrial practice for supposed easy money, and make of it an ordinary commercial business, forgetting that the workingman has a right to be treated honestly as a patient, and that the employer and insurance company also have very definite interests.

WHAT INSURANCE CARRIERS DESIRE

It might be well to set down briefly what insurance companies demand, and, very properly, get from the modern industrial surgeon equipped to meet the demands of this type of practice:

1. Prompt detailed reports to the company; by telephone in serious cases. The surgeon's report is usually the first received. It must fully answer all questions in first report forms.

2. If a definite diagnosis or prognosis cannot be made within twenty-four hours a supplementary report should follow at the earliest moment when a definite decision is arrived at. Many surgeons wonder why cases are transferred? If a surgeon seems reluctant to report cases it appears to the insurance company either as evidence of fear that he will not be considered competent, or as an effort to "cinch" retention of the case regardless of the company's wishes.

A specialist may be desired in emergencies or otherwise and the insurance company is entitled to the opportunity to say so. If in doubt at any time call the insurance company.

3. Be sure the case is compensable. If in doubt communicate with the insurance company immediately.

4. If possible always have an order from the employer authorizing treatment.

5. *Disability Estimates.*—Insurance companies want the facts, not excessively optimistic reports; the truth is of more value. Subsequent reports are very essential especially when first estimates have to be changed. When a patient is instructed to return to work immediate notification should be sent to the company.

Estimates.—Under the law, before compensation is paid there is a waiting period of seven days, compensation commencing on the eighth day. Insurance companies are not interested in the waiting period, but if complications arise it is to their direct interest to be immediately acquainted. Notify them at once if the original estimate is extended. This is important to insurance companies because the law compels them in all cases to establish reserves to meet incurred future payments. The estimated period of disability and treatment must be as exact as possible.

Exaggerate your period of disability rather than minimize. You cannot curry favor with insurance companies by low estimates and poor results. The companies would far rather be able later to reduce an estimated outstanding reserve than be compelled to increase it.

Do not state that estimated disability "varies." The insurance companies want a definite opinion as to the estimated disability. A surgeon cannot always be correct, but one whose average estimate of disability is close is appreciated by an insurance company.

6. *Send Reports Promptly.*—Remember insurance companies are charged with prompt payment of compensation and delays can usually be traced to nonreport by the attending surgeon or to vagueness of a report rendered. This does injustice to the workingman and reflects upon the service of the insurance carrier.

7. *Consultants and Transfers.*—If you believe a consultant is necessary communicate with the insurance company for approval.

Consultations should be encouraged by the industrial surgeon. You must not avoid them, and the insurance companies do not wish you to avoid them. They frequently are their safeguards.

DISAGREEMENTS WITH INSURANCE CARRIERS

Insurance companies and doctors often are at loggerheads. Why? The doctor does not give the coöperation to insurance companies that he does to private patients. He ignores them. With private patients he discusses procedures; why not with insurance companies? The surgeon should have the confidence of the insurance company that chooses and pays him.

If a company asks you to transfer a patient to another surgeon who usually is their chief surgeon, do not refuse or be perturbed. There is usually a very good reason from the carrier's standpoint for the transfer, and no reflection on your ability is intended.

FEAR PSYCHOLOGY IN PATIENTS

In industrial surgery "fear psychology" or whatever you like to call it, is an important consideration in the treatment of patients. In back injuries, for example, do not discourage a man or

add to his mental infirmity by telling him what an extended disability he will have. Back injuries from experience are of uncertain duration and serious harm is often done by an attending surgeon who goes into too much detail about an injury of a trivial character.

How often do you see compression fracture of vertebrae or markedly displaced fractures of transverse processes heal with a very low permanent disability in cases where the encouragement of neurosis has not been fostered by injudicious medical advice? In cases of a simple crack of a transverse process, patients after being informed of these facts have given up and become cripples for life; whereas others with severe and displaced fractures have returned to work in a few months. Do not add to the mental infirmities or fears of any patient. Avoid all unnecessary casts, tailor braces, and other apparatus, unless there is very strong indication for their use.

8. *Medical Expenditures.*—Do not make a practice of having patients come in day after day unless a redressing or personal observation is absolutely necessary. This adds unnecessary costs. If clinically there is no evidence of fracture do not burden the company with additional costs of x-rays.

An x-ray, because of poor quality, from which a diagnosis cannot be made, is not an x-ray, and charge should not be made therefor. Lack of technique or errors on the part of the attending surgeon or x-ray technician are not a basis of charge against an insurance company.

9. *Special Examination and Special Reports.*—For general use the following outline is of benefit:

1. Description of original injury: Carefully and completely diagnosed.
2. Present condition: Picture of condition today with reference to original injury—what progress can be definitely noted.
3. Future prognosis: Relation of condition today to end-result. What additional progress is reasonably certain and what is problematical.
4. Type of treatment indicated.
5. Period of disability and treatment.
6. Permanent disability—amount, if any.
7. Record of present rating: Compare present physiotherapy reports with report made on entrance to physiotherapy department.
8. Contributory factors: Arthritis—preëxisting. Constitutional conditions, etc.
9. Conclusions.

Some doctors think they are creating good will with insurance companies by getting the patients off their books and back to work before they are ready to go. Cases thus treated only add to permanent disability costs.

Classical operations should not be performed if in their very nature they are obviously experimental.

VALUE OF PHYSIOTHERAPY

It is reasonable to expect that the advanced surgical procedures for rehabilitation, and associated treatment, now in vogue would increase medical costs, but if these procedures are justified, compensation payments, including permanent disability awards should be reduced accordingly. On the contrary, these costs have risen. What is the explanation? In no small measure it is due to an abuse, as an easy source of income, of wartime procedures such as physiotherapy, and purely experimental operations that do not always produce results. Physiotherapy must be intelligently applied. Work therapy is better than any physiotherapy if the patient is capable of doing the most menial labor.

The value of physiotherapy was confirmed by results in treating war invalids when surgery alone was found not to be always sufficient. Many special physiotherapy institutions were organized throughout Europe and the United States. If its use was indispensable during the war, in time of peace physiotherapy can be also of great help in treating injuries of all kinds including industrial injuries. The value of this additional line of medicine can be appreciated only by those who have observed the results achieved.

Physiotherapy is employed (1) to increase blood supply in parts affected, improve the circulation, nutrition and metabolism, to absorb infiltrations and effusions and quicken restoration of tissues to normal; (2) to build up muscles that are weakened from disuse after immobilization of fractures, etc.; (3) to reduce or lessen stiffness of joints following long application of splints or after joint injuries; (4) to stimulate nerves if they are in a state of paresis due to injury; (5) to combat infection.

According to conditions diagnosed different means of physiotherapy treatments are applied, alone or in combination.

Galvanic and faradic currents are also used for diagnostic purpose, for nerve and muscle-testing in peripheral and some central nerve lesions. The reaction of degeneration can be made, the diagnosis and prognosis indicated, and malingering exposed.

In nerve injuries a combination method of radiant heat, massage, electricity in form of diathermy and interrupted galvanic and faradic currents is used to prevent accompanying atrophic, sclerotic, and fibrous changes and to help to regenerate the structures affected and prevent permanent stiffening and ischemia. This method gives very satisfactory results; for instance, in facial palsy, if started soon enough after the injury.

For the union of fractures, stimulating technique is in order.

For the chemical effects of ionization the galvanic current is used.

In industrial medicine one has to deal with infections and skin diseases, occupational or otherwise. This is a field for actinotherapy. Radiant light and heat from carbon filament lamps will destroy many germs. Ultra-violet rays destroy all bacteria and fungi after a short exposure. For this a water-cooled quartz lamp is used locally with pressure to produce anemia and to enable ultra-violet rays to penetrate. Simultaneously with the local treatment general radiation with an air-cooled lamp gives better results by producing

various chemical changes in blood, by increasing the leukocyte count and calcium content, as has been proven by experiments. Staphylococcic infection yields readily to ultra-violet therapy, as in furunculosis or infected lacerations. The air-cooled lamp is used alone in cases of secondary anemia or malnutrition, as in lead poisoning; or may be used in conjunction with iron and arsenic injections.

The above outlines briefly some of the uses of physiotherapy in industrial medicine. Injudicious or protracted use of physiotherapy or use of it without a diagnosis should be condemned.

To control the effects of physiotherapy on patients, we use the following scheme:

Patient is first examined and diagnosed.

The findings are expressed in the form of physiotherapy report on special physiotherapy report blanks, corresponding to the part of the body that was injured.

Patients are examined periodically and progress is similarly noted.

Treatment is stopped when there is no further progress.

CONCLUSION

It is incumbent upon our Industrial Accident Commissioners and those associated with them to uphold the law and protect the interest of the workingman. It is also our duty as members of our profession to protect them. Our efforts must not be selfish or show any attempt to curry favor with insurance companies. We must live up to the ideals of our profession and work to maintain its reputation. We must be most concerned with the recovery of the patient as a matter of professional endeavor, over and above any provisions of the law.

An employer should seek the best medical or surgical attention. An employee does not gain by injury, but rather loses his earnings in excess of his compensation; and his family are deprived of income, and therefore suffer with him. The employee knows that when injured he quickly goes into debt because of the loss of his earnings and income, and therefore he is anxious to be restored to health as a wage-earner and be able to fulfill his duty as a provider and avoid becoming a burden on the community.

Insurance companies and employers are interested in results. Get the injured back to light work, but not to the detriment of the injured. Employer's rates are influenced by losses. Your care of the man is not a special privilege for you. The Workmen's Compensation Act was not created for the benefit of the medical profession or others that might benefit under it, but for protection of the workingman, and is today subscribed to whole-heartedly by all intelligent employers. Insurance company adjusters are not ordinarily medical men. They are interested in the results obtained by whatever treatments are adopted. In medico-legal problems, whether in court or before the Industrial Accident Commission, know your subject and speak the truth without bias.

Do not violate the ethics of the profession by accepting rebates or cutting rates. This will not be asked if the doctor is giving value received, because statistics show the best service is the most economical.

Whether a patient be a private patient or under the jurisdiction of the Industrial Practice Act we must not have two methods of treatment. Treat both alike. We cannot have two kinds of manners. The patient comes first. Wait on him, serve him and rehabilitate him as a wage-earner.

Efficiency in medical industrial practice cannot exist without regulations. Insurance companies' "paper work" and their requests are tiresome and at time irritating, but they are necessary nuisances.

If you wish to pursue industrial practice realize not only that efficient surgical service is demanded, but that the paper work is also required. Writing reports does not make an industrial surgeon.

The five major requirements for an industrial surgeon are:

1. To treat a patient as a man, and act as man to man.
2. To have a thorough knowledge of the Compensation Act.
3. To have an accurate knowledge of insurance regulations.
4. To have real surgical ability and equipment.
5. To obtain good results; for apologetic explanations are not wanted in industrial practice.

A physician or surgeon who would make a success of the exacting practice of industrial medicine must specialize in the work attempted, and must give sympathetic and understanding care. These are now conceded to be the fundamentals in industrial practice.

560 Sutter Street.

DISCUSSION

C. A. DUKES, M. D. (426 Seventeenth Street, Oakland).—Doctor Eaves, in his paper on "The Industrial Physician—His Relation to Patient and Carrier," has discussed a very interesting and timely subject.

Under requisites of an industrial surgeon, Doctor Eaves aptly states that the social status of the patient should not have any bearing upon the type of treatment nor the manner of treatment. The surgeon's equipment should be of the character to give the most modern and best treatment available for the conditions for which the patient must be treated. The untidy surgery may not necessarily be dirty, but certainly is not to be compared to the modern bright room with its tile floor and shiny equipment.

I am glad to have him speak of the type of men who today are doing industrial surgery. They are alert, energetic, and thoroughly qualified. Many of us can remember the old-time industrial surgeon who handed out the black pills from an untidy office, giving very little thought to diagnosis or the patient's general condition.

In speaking of the amount of work necessary to make an industrial surgeon financially successful he again emphasizes the success of group medicine because, in handling a large industrial practice, it is necessary to employ or have associated with you a varying number of assistants whose work should be directed by a head whose ability is unquestioned and whose personality lends confidence to those placed under his care.

Another of the points made in the paper is the necessity for accurate and prompt clerical work. The

average physician is not a good clerk; consequently, if he is to do much industrial work and keep his reports properly cared for, it is necessary to have a trained clerical force. Both the nurse and stenographer will require definite training in this type of medical reports.

I am glad the doctor has brought out so well the relationship which should exist between the insurance carrier and the doctor, and also his responsibility to the state.

Physiotherapy should be carefully studied not only as regards apparatus, but as to psychological factors that are necessary to return confidence in the injured employee as to his future and his ability to return to the labor for which he is fitted.

Further emphasis will not be amiss on the fact that an industrial surgeon is no different from any other surgeon excepting in the classification of the work with which he will come in contact. He must be thoroughly trained, a hard worker, and have the mental equipment necessary to handle people of meager education.

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OTTO R. FRASCH, M. D. (315 Montgomery Street, San Francisco).—The Workmen's Compensation Act holds the employer liable for compensation and medical care for all injuries sustained by his employees in the course of and arising out of their employment. In nearly all cases the employer's liability is assumed by an insurance carrier. Since the insurance carriers are thus obliged to furnish and pay for medical aid and for any temporary or permanent disability incurred, it is natural that they should have a considerable interest in the medical status and treatment of the cases for which they are responsible. It is essential that the surgeon should keep the insurance carrier promptly and fully informed of the medical aspects of the case so that the insurance carrier can properly pass on the claim, set aside the proper reserve for the injury and, if it so desires, arrange for further medical service by specialists or by consultation, etc. Doctor Eaves has described in detail the essential points to be covered in such reports.

The idea seems to prevail in some quarters that insurance carriers are interested only in securing the cheapest possible medical service. This is probably a hold-over from the attitude toward the old style company doctor, whose work in many cases was of a very perfunctory nature. Since, however, insurance companies are obliged to pay the injured employee's compensation for the period of his temporary disability and are often obliged to pay large sums for permanent disabilities, they have learned that in most cases "cheap" medical service is costly. Their interest is in the total cost of a case, including compensation for permanent disability if any, compensation for temporary disability and medical costs. Considered from that viewpoint, there is no conflict between the interest of the injured man, the insurance carrier and the surgeon, who is sincerely interested in rendering the best possible service. As a result of the Workmen's Compensation Act, which definitely fixes liability for temporary and permanent disabilities, we for the first time have a definite check on the end-results of different types of treatment for various types of injuries in a large series of industrial accident cases. The results are tabulated and compared; and the methods that experience has proven the better are adopted, the poorer methods dropped. Insurance carriers are also filing their experiences with the different surgeons who do their work, and there is a natural tendency to prefer the surgeons who secure the best results. The first great requisite for the industrial surgeon is, of course, surgical judgment and skill. I should like to stress also the importance of coöperation: coöperation with the employer in rendering prompt service to injured employees that they may be returned to work as soon as possible; coöperation with the injured man that his confidence will be maintained and his morale sustained—an important factor in many types of industrial injuries; and coöperation with the insurance carrier that he may better fulfill his obligation to employer, doctor and injured employee.

THE LURE OF MEDICAL HISTORY

CLAUDE BERNARD

By JEAN OLIVER, M. D.
San Francisco

DOUBTLESS the preacher spoke from the depths of a profound knowledge when he lamented, "There is no new thing under the sun." For when we seek the origins of even the most miraculous of our modern inventions, the deeper our study goes the less able are we to pick out from the countless numbers who have labored at the edifice of mankind's achievement any few whose contribution was more than a tiny addition to the work of his predecessors. Occasionally some fortunate one places the final and perfecting touch to that which has been laboriously prepared and the world, astonished, hails a creator.

But these are, in the stricter sense, the lesser heroes of mankind's advancement. Many are the hands willing, if the METHOD be shown, for with a method results must fall to the industrious and to the fortunate. Behind these men, whose names and images are in every mind, stand others of whom we think less often, perhaps because their work, not so obvious in its immediate results, requires for its appreciation more attention than the rush of today's busy life affords. These latter are they who turned the course of man's endeavor into new and fruitful fields and who showed the gleaners where the harvest was richest. In medicine, such a one was Claude Bernard.

Medicine had advanced, halting at times, but always forward, and at each step we see the result of some new method. The first formulations of the Greek physicians that were guided by classical philosophers; the dubious gains of the medieval school soon lost in the maze of dielectic and logic; the breaking of these chains by the new humanities of the Renaissance, this promise only to fall into the sterile finality of the systematists. During all these years the clinician, from his post at the bedside, had observed, described and deduced to the limit of human acuity. The anatomist had exhausted the wealth of gross pathology and though Virchow had only begun his application of the microscope to the study of morbid structure, this method, too, could only hope to approach a similar limit. Bacteriology was to add tremendous gains in its restricted field. The new chemistry and physics awaited a method of application to vital phenomena.

Such had been the course of the acquisition of medical knowledge when in 1865 there appeared "L'Introduction à L'Étude de la Médecine Experimentale." The new era was established.

Medicine of today is experimental medicine, not only in the laboratory but in the clinic and at the